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MANUAL OF ARMY SIGNAL SERVICE—WAR. (PROVISIONAL)

1914.

GENERAL STAFF, WAR OFFICE.



LONDON:
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By HARRISON AND SONS, 45-47, ST. MARTIN'S LANE, W.C.,
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*Captain Andrew Morrison
Cambridge*

*This Manual is issued by command of the Army Council
for the guidance of all concerned.*

R. H. Wade

WAR OFFICE,

3rd August, 1914.

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MANUAL OF ARMY SIGNAL SERVICE—WAR.

CHAPTER I.—OBJECT AND GENERAL ORGANIZATION OF THE ARMY SIGNAL SERVICE IN WAR.

1. OBJECT AND COMPOSITION OF THE ARMY SIGNAL SERVICE.

1. The Army Signal Service supplies the organization by which the means of intercommunication, other than the postal services, provided with a force in the field, or existing in the theatre of operations, can be used to the best advantage for co-ordinating the movements of that force for distributing intelligence, and for general military administrative purposes.

2. The Army Signal Service forms one of the administrative services of the army, being controlled by the Director of Army Signals, who receives his instructions from the General Staff. It is composed of signal squadrons, troops and companies, each unit being furnished with material suited to its special functions.

2. GENERAL ORGANIZATION OF THE ARMY SIGNAL SERVICE IN THE FIELD.*

1. The service is organized generally on the principle that commanders should arrange for communication with, and between, their subordinates (Field Service Regulations, Part I. Section 8, 2). Signal units are therefore allotted to the component parts of a force for employment by the commanders in providing the intercommunication required within their commands.

The usual allotment of signal units and their special functions are as follows :—

* The Army Signal Services of fortresses and defended ports have certain special duties to fulfil, but are organized on the same general principles as the signal service of an army in the field.

Name of Unit.	Allotted to	Principal Functions.
Signal Squadron ...	Cavalry division ...	<p>(i) In co-operation with army troops, or other signal units, to maintain communication between cavalry divisional headquarters and general, or army, or other subordinate headquarters.</p> <p>(ii) To provide communication between cavalry divisional headquarters and the cavalry brigades and divisional troops composing the division, and with reconnoitring detachments.</p>
Signal Troop ...	Cavalry brigade ...	<p>To provide communication between brigade headquarters and cavalry regiments or detachments belonging to the brigade and, when necessary, with superior or neighbouring subordinate headquarters.</p>
Divisional Signal Company	A division ...	<p>To provide intercommunication within the division, other than that within regimental units, and, when necessary, with superior or adjacent subordinate commands.</p> <p>Headquarters and No. 1 section are usually employed for divisional headquarters communications, while Nos. 2, 3 and 4 sections are organized with a view to employment with infantry brigades.</p>

Name of Unit.	Allotted to	Principal Functions.
<p>Army Troops— (a) General Headquarters Signal Company. (b) Army Headquarters Signal Companies. (Air-line, cable and wireless sections are included as required).</p>	<p>General and army headquarters as may be required.</p>	<p>(i) For inter-communication between general headquarters, army headquarters and cavalry or other subordinate headquarters as may be required. (ii) For inter-communication between army headquarters and the divisions, &c., composing the army. (iii) For linking up general and army headquarters with the L. of C. signal system.</p>
<p>Signal Company— L. of C.</p>	<p>Headquarters I.G.C.</p>	<p>For providing the army signal system within the limits of command of the Inspector-General of Communications.</p>

2. The details of the organization of the units and of the equipment with which they are provided will be found in War Establishments (Parts I and II) and in the Field Service manuals of the units. Generally, signal units with cavalry employ wireless stations, telegraph and telephone cable, visual signalling, and despatch riding by motor-cycle, horse and bicycle. A divisional signal company employs telegraph and telephone cable, visual signalling, and despatch riding. Army troops signal companies are composed of a headquarters and such air-line, cable and wireless sections as may be allotted, together with motor-cyclist despatch riders. A signal company, lines of communication, is provided with permanent line material, air-line, telegraph cable, &c., as may be required, and motor-cyclist despatch riders.

3. Should it be necessary to supplement the personnel at the disposal of the Director of Army Signals by the provision of special messengers, or relays to carry messages in the field, the General Staff is responsible that the requisite numbers of officers or men are furnished. In divisions, the divisional mounted troops may be used for this service.

3. REGIMENTAL INTERCOMMUNICATION.

1. Intercommunication within cavalry regiments, artillery brigades, battalions, engineer and other units is not provided by the Army Signal Service, but by personnel trained for the purpose within the unit.

There should, however, always be the closest co-operation between regimental commanders and the Army Signal Service who must be prepared to render each other mutual assistance in establishing intercommunication.

2. The details of signal personnel and equipment provided

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with units other than signal units will be found in War Establishments and the field service manuals of units.

4. RELATIONSHIP OF THE ARMY SIGNAL SERVICE WITH THE TELEGRAPH AND TELEPHONE ADMINISTRATIONS IN THE THEATRE OF OPERATIONS.

1. In order to economise the transport of military telegraph and other equipment, and in the time and personnel required to erect the lines, it is important that the employment of the telegraph and telephone systems existing in the theatre of operations should be studied. In the case of the lines of communication, these will generally form the major part of the military signal system.

2. In the United Kingdom, the general principle governing the relationship of the Army Signal Service to the General Post Office is that the latter will continue in war to maintain and work the system for which it is responsible in peace. The Postmaster-General is, therefore, responsible for meeting military requirements on the General Post Office telegraph and telephone systems, except where military exigencies within the immediate field of operations necessitate a part of the system being taken over and worked and maintained by the Army Signal Service.

3. In a friendly country the Army Signal Service, though distinct from, and independent of, the civil telegraph and telephone administrations, will make use of, and work in co-operation with the latter in so far as the commander-in-chief may direct.

4. In a hostile country in occupation by a British expeditionary force, and in districts where martial law is in force, the civil telegraph and telephone systems are controlled by the Director of Army Signals.

CHAPTER II.—DUTIES OF THE DIRECTOR OF ARMY SIGNALS AND HIS REPRESENTATIVES.

5. RESPONSIBILITIES OF THE DIRECTOR OF ARMY SIGNALS.

1. The Director of Army Signals is responsible for the organization and maintenance of all means of intercommunication other than postal throughout the theatre of operations, including communication with aircraft* (vide Section 8 (4), and is also the adviser of the commander-in-chief on all technical matters connected with the signal service.

2. Subject to the orders issued by the commander-in-chief, the Director of Army Signals is responsible for arranging with the naval authorities as to the wireless communications to be established with the Navy, for the administration and distribution of the units of the Army Signal Service, and for the employment of those units not allotted to subordinate commands.

He has representatives at subordinate headquarters as follows :—

Headquarters of Inspector-General of Communications—A deputy director of army signals.

„ of an army—An officer i/c army signals.

„ of a cavalry division—The O.C. signal squadron.

„ of a division—The O.C. divisional signal company.

„ of a cavalry or mounted brigade—The O.C. signal troop

3. The Director of Army Signals is authorized to communicate direct with his representatives on all matters of administration and technical detail connected with the Army Signal Service, and his representatives are similarly

* He is not responsible for the provision of operators nor for the provision and maintenance of wireless equipment for aircraft.

authorized ¹to communicate with one another on such matters.

4. In regard to railways administered by the Director of Railway Transport, the Director of Army Signals is responsible for providing the personnel and equipment for the erection and maintenance of all telegraph, telephone and block signalling lines required by the former; also for the supply of all stores and instruments that are necessary for them. He provides the operators to work the circuits other than the operators for the telephone and block signalling circuits.

For the erection and maintenance of the lines there is a representative of the Director of Army Signals at the headquarters of the Director of Railway Transport, whose requirements in men and material are met by the Deputy Director of Army Signals, Lines of Communication. (See Section 6, 2).

5. The Director of Army Signals usually accompanies general headquarters. He has an Assistant-Director of Army Signals with his headquarters to assist him in the details of administration of the service.

6. The senior officer of the army troops signal units at general headquarters performs the executive duties of officer in charge of Army Signals at that headquarters, receiving his instructions from the Director.

The latter daily notifies the general staff officer of the operations section of the General Staff responsible for staff duties in connection with inter-communication, for the information of the commander-in-chief, as to the arrangements made, and as to any signal units held in reserve to meet special requirements.

He informs this staff officer in regard to any change in the allotment of signal units to subordinate commanders, and as to any special arrangements to be made by those commanders, which he may consider necessary to ensure the efficiency of the signal system for operations contemplated or in progress. The orders to the commanders are issued by the General Staff.

7. The administration of the service includes the following duties :—

- (i) Arrangements with the General Staff for the collection of information as to the telegraph and telephone systems existing in the countries embraced by the theatre of operations.
- (ii) The co-operation with friendly telegraph, telephone and cable administrations in the theatre of operations and on the lines of communication for the use of their systems.
- (iii) Under the authority of the commander-in-chief, the issue of such technical instructions as may be necessary for the administration of the Army Signal Service.
- (iv) To ensure that the personnel of the service is acquainted with the regulations in regard to censorship in so far as they apply, and that these regulations are strictly adhered to.
- (v) To bring to the notice of the General Staff the necessity for protection of any part of the Army Signal Service system.
- (vi) Arrangements with the Inspector-General of Communications and Adjutant-General's office at

the Base for the suitable distribution of reinforcements to signal units in accordance with the qualifications of the personnel.

- (vii) Any special arrangements with the administrative services and departments of the army concerned for the provision of the stores, supplies and transport required by the Army Signal Service.
- (viii) Within the theatre of operations, arrangements for engaging civilian personnel and labour, and purchase of materials.
- (ix) The establishment of the Signal Clearing [House for messages, and the necessary financial arrangements in connection therewith. (*See* Chap. VI.)

6. DUTIES OF THE DEPUTY DIRECTOR OF ARMY SIGNALS, LINES OF COMMUNICATION.

1. The Deputy Director of Army Signals is the technical adviser of the Inspector-General of Communications on all matters appertaining to the Army Signal Service, and under his orders, and within the limits of his command, he is responsible to him for the organization and efficient working of the whole of the Army Signal Service on the lines of communication, except such portion of it as is placed under the Director of Railway Transport for the working of the railways.

2. The Deputy Director of Army Signals is responsible to the Inspector-General of Communications for the arrangements made to meet the requirements of the Director of Railway Transport in personnel, stores and equipment for erection and maintenance of the railway telegraph, telephone and block signalling circuits, and for operating telegraph circuits.

The representative of the Director of Army Signals attached to the headquarters of the Director of Railway Transport notifies the Deputy Director of Army Signals, Lines of Communication, as to the intercommunication personnel and equipment necessary to provide the intercommunication service required by the Director of Railway Transport.

3. Subject to the orders of the Inspector-General of Communications, the Deputy Director of Army Signals is responsible to the Director of Army Signals for the technical administration of that portion of the Army Signal Service placed under his control. His duties under this head will usually include :—

- (i) The enforcement of the regulations in regard to technical working and finance, and, in so far as they apply to signal traffic, the censorship regulations.
- (ii) Arrangements with friendly telegraph, telephone and cable administrations on the lines of communication in regard to technical working.
- (iii) Organization and supervision of such store depots and repair shops for signal equipment as may not be under the control of the Army Ordnance Department.
- (iv) Early notification to the Director of Army Signals as to additional personnel and special technical stores and equipment required by himself or by the Director of Railway Transport.
- (v) Working of the Signal Clearing House.

7. DUTIES OF THE OFFICER IN CHARGE OF ARMY SIGNALS WITH THE HEADQUARTERS OF AN ARMY, AND OF OFFICERS COMMANDING SIGNAL UNITS WITH DIVISIONS AND BRIGADES.

1. The duties of an officer in charge of army signals with the headquarters of an army, or of an officer commanding a signal squadron, signal troop or divisional signal company are :—

- (i) To act as the technical adviser of the commander concerned in matters appertaining to the Army Signal Service, receiving his instructions through the General Staff.
- (ii) Under the orders, and within the limits of the command, responsibility for the general organization, maintenance and efficiency of the Signal Service.
- (iii) To keep in close touch with the General Staff as to the arrangements to be made by him for intercommunication. Where these arrangements necessitate orders being issued to subordinate commanders as to the employment of the signal units, or other intercommunication personnel under their command, such orders will be issued through the General Staff.

2. An officer in charge of army signals, or an officer commanding a signal squadron, troop, or company, is responsible to the Director of Army Signals for the following :—

- (i) For enforcing such technical instructions as may be issued in connection with signal traffic and censorship regulations.
- (ii) For maintaining in an efficient condition the signal units or detachments directly under him.

He will keep the Director of Army Signals informed as to the demands made by him on dépôts on the lines of communication for personnel, transport and equipment to replace casualties or losses.

- (iii) For the collection of information in regard to the condition and resources of the existing telegraph and telephone systems in the areas traversed by the formation to which he belongs.

3. The officer commanding a signal company with a division forming part of an army will communicate with the Director of Army Signals, through the officer in charge of army signals with the army headquarters.

4. The commander of a signal troop with a cavalry or mounted brigade, or of a section of a signal company with an infantry brigade, acts under the orders of the brigade commander, and has duties in regard to the signal service of the brigade analogous to those of an officer commanding the signal squadron or a signal company with a division. Unless the brigade to which his troop or section is allotted is acting independently, on technical matters he communicates with, and takes orders from, the commander of the signal squadron or signal company of his division.

CHAPTER III.—EMPLOYMENT OF SIGNAL UNITS.

8. GENERAL INSTRUCTIONS.

1. The functions of the units comprised in the Army Signal Service have been outlined in Chapter I. It must, however, be understood that in an emergency it may be necessary for the whole or part of a signal unit to be withdrawn for employment elsewhere. In this event it is the duty of the commander from whose command the unit or detachment has been withdrawn to make the best arrangements possible for intercommunication within his command with the personnel remaining at his disposal.

2. A good system of intercommunication requires careful co-ordination and economical employment of the several means of intercommunication available, and effective arrangements to this end can be made only where the signal officer in charge of signal communications at a headquarters is given the earliest possible information as to projected operations or movements.

While keeping in close touch with the General Staff, an officer in charge of signal communications at a headquarters must be prepared at all times to act on his own initiative in organizing the necessary signal communications.

The General Staff will keep subordinate commands informed as to the arrangements to be made for communication with and between them. It is the duty of the subordinate commanders to render assistance in giving effect to the arrangements.

The establishment and maintenance of intercommunication in the field will frequently require assistance from the fighting troops, and it is the business of the General Staff, after conferring with the Director of Army Signals or his representative, to arrange for the necessary protection.

3. It is a principle that some portion of the means of communication should be kept in reserve as long as possible to meet unexpected requirements. When this reserve is used up steps should be taken to collect a fresh reserve. Thus where cable telegraph or telephone lines are employed suitable opportunities should be taken to replace cable lines by others following shorter routes and to recover the old lines for further use. When visual signalling or despatch riding is employed, subordinate commanders will usually provide the signalling stations or despatch riders at their end of the line, intermediate (transmitting) stations or relay posts being found as ordered by the superior commander; this also applies to operators for field telephone lines, if operators are not available with the detachments laying the lines.

4. Whenever military wireless stations from more than one unit are working in the same area, the Director of Army Signals or Senior Signal Officer will issue instructions as to the wave lengths and times of working to be used.*

5. The use of wireless by aircraft will be regulated by the Director of Army Signals in consultation with the General Staff and the commander, Royal Flying Corps.

Subject to such instructions as may be issued by the General Staff, the Director of Army Signals, or his representative in subordinate commands, will be responsible for the maintenance of intercommunication between the headquarters concerned and aircraft landing places, if the Commander, Royal Flying Corps, is unable with the means at his disposal to make the necessary arrangements himself.

* Special instructions are issued for wireless communication with H.M. Navy.

9. EMPLOYMENT OF A SIGNAL SQUADRON AND OF SIGNAL TROOPS WITH CAVALRY BRIGADES.

1. An important function of the signal squadron and signal troops allotted to the cavalry division and cavalry brigades is the provision of a system of intercommunication, by means of which information collected by reconnoitring troops may be transmitted rapidly to cavalry divisional headquarters and thence to general headquarters, and, if necessary, to the headquarters of other bodies of troops with which the cavalry division may be in touch. At the same time administrative requirements must not be neglected. The responsible signal officer should ascertain from the General Staff the movements of ammunition parks and supply columns, and the location of rendezvous and refilling points, as may be necessary, in order to communicate with them. In action it may be necessary to provide communication with dressing stations of the cavalry field ambulances.

2. The methods of communication employed will depend upon such factors as the nature of the operations and topography of the theatre of operations; but despatch riding will be most generally employed, and, where other means are used, will probably be required in conjunction with them, or as an alternative in case of breakdown.

The first care in organizing the signal service of the cavalry division should be, therefore, to establish an efficient system of intercommunication by despatch riding.

3. For the successful use of wireless telegraphy in the field a high degree of technical organization and control in the working of the wireless stations is required. In the employment of the stations provided with the signal squadron these technical requirements must therefore be carefully considered.

The maintenance of wireless communication with general headquarters is of the first importance, and the opening of other wireless communication must generally be subordinated to it. Two wagon wireless stations may be required for this purpose in order that continuous communication may be maintained when on the move, the working station being connected with cavalry divisional headquarters by despatch riders or by the cable telegraph detachments.

4. The permanent telegraph lines existing in the theatre of operations may frequently be employed in conjunction with the cable telegraph detachments for communication with general headquarters or with headquarters of troops co-operating with the cavalry division.

The officer in charge of the signal service at the distant headquarters must, however, be given clear information by the officer commanding signal squadron as to the permanent line it is proposed to employ, and the hour at which it is desired to open communication.

5. Visual signalling must at all times be used with discrimination by cavalry on account of the danger of disclosing their positions to the enemy. Though not sufficiently rapid to be well adapted for intercommunication between bodies of cavalry on the move, in suitable country it will be of value—

- (i) When cavalry is at rest or employed on operations involving little movement.
- (ii) For communication to reconnoitring troops, the latter connecting by despatch riders with the visual signalling station.

- (iii) For communication across obstacles, such as rivers not easy of passage.

10. EMPLOYMENT OF A DIVISIONAL SIGNAL COMPANY.

1. A divisional signal company is organized primarily with a view to providing a system of intercommunication throughout the division for battle on the following principles.

No. 1 section of the company will usually be employed for the establishment of communication between divisional headquarters and infantry brigades and other units, or groups of units, within the division as may be required.

Except when on the move, cable will be employed for the most part, visual signalling and despatch riders being used when cable communication cannot be arranged or when the cable lines break down.

The officer commanding a signal company should consult divisional artillery headquarters as to the arrangements for communicating with subordinate artillery commanders, in order that the means of communication provided by the signal company and those available with artillery units may be combined in the most economical and efficient manner. Direct communication between the officer commanding a particular attack and the artillery supporting that attack should generally be arranged. This may be done by No. 1 section, the infantry brigade section, or the artillery brigade intercommunication personnel, according to circumstances.

Nos. 2, 3 and 4 sections of the company are primarily organized for employment with infantry brigades in providing such communication between the brigade commander and units under his command as may be necessary, but, if circumstances require, they may be employed on other duties.

Commanders of adjacent infantry brigades should, when possible, always open up direct communication with each other by visual signalling or despatch riders.

2. When a division is on the march few opportunities will occur for employment of cable telegraph or telephone lines, and resort must usually be had to visual signalling and despatch riders. In some cases, however, cable telegraph communication may be practicable between the main body and advanced or rear guards.

3. When cable communication with outpost troops is required at night, in order that the employment of the cable detachments next day may not be prejudiced, the length of cable laid out should be a minimum.

4. For night operations cable communication combined with a carefully organized system of bicycle despatch riders and foot orderlies may be practicable.

5. While special provision for continuous communication between divisional headquarters and the administrative units serving the division will rarely be required, the commander of the signal company is to ensure that messages can be transmitted, with as little delay as possible, between divisional headquarters and the headquarters of the train and the field ambulances respectively.

The commander of the signal company should also be informed as to the location of the rendezvous for the supply column and ammunition park and of the refilling points so that he may be in a position to communicate with the commanders of those units when they have left the sphere of command of the Inspector General of Communications.

In the case of the medical service, in the event of an action,

he will inform the Assistant Director of Medical Services of the dispositions of the signal service to enable the latter to inform the commanders of field ambulances of the nearest signal stations to their headquarters through which they can communicate. It may also be necessary to make special provision for communication between the A.D.M.S. and field ambulances.

11. EMPLOYMENT OF ARMY TROOPS SIGNAL UNITS.

1. The army troops signal units provide the system of intercommunication between general headquarters, army headquarters and cavalry or other subordinate headquarters as may be required. They are also employed to link up this system with the signal service on the lines of communication. The communications provided by these units, therefore are the principal means by which the movements of the whole force are co-ordinated, intelligence distributed, and supply arrangements made. For these purposes continuous telegraph communication should as far as possible be maintained ; and to this end the Director of Army Signals, under instructions from the General Staff, makes the most suitable allotment to general and army headquarters of the air-line cable and wireless signal sectional sections.

2. No definite instructions can be laid down as to the organization of the communications provided by the army troops signal units in the various phases of operations—advance and retirement, attack and defence—as this must depend on the grouping and relative positions of the formations of which the army is composed, the topography of the theatre of operations, and the extent to which the telegraph and telephone systems in the theatre of war can be utilized.

The following general principles, however, govern the employment of the army troops signal units.

3. The communications between general headquarters and the cavalry division and cavalry brigades acting directly under general headquarters will be maintained by wireless stations, by the existing telegraph system of the country if possible combined with cable telegraph lines, or, in conjunction with these means, by despatch riders.

4. The communications between general and army headquarters and divisions will be principally by cable telegraph, supplemented, when suitable, by air-line and any existing permanent lines. It will, however, not usually be possible to maintain telegraph communication without a break between headquarters while they are on the move, and at such times the motor-cyclists provided with the army troops signal units can be usefully employed for linking up the headquarters with the last report centre which must remain open until the telegraph system has been completed to the new headquarters. Wireless telegraph stations when available may also be employed for this purpose.

5. During battle it is generally necessary to establish a report centre for general and each army headquarters. These centres must be carefully selected with reference to the area likely to be covered by the operations and the probable movements of the general or army headquarters, in the close vicinity of which they should, when possible, be located. These centres are connected by cable telegraph lines to the several subordinate headquarters with which intercommunication is required, while communication between a centre and the headquarters it is serving is arranged, when necessary,

by means of one or more cable lines according to the amount of signal traffic to be dealt with.

6. In retreat it is generally necessary to push cable telegraph detachments rapidly back to organize a fresh cable system to meet the new situation some way in rear, the cable lines being reeled up by other detachments as the troops retire.

7. Connection with the signal system of the lines of communication will usually be made by air-line or by the permanent telegraph system of the country, the points of junction with this system being determined from time to time by the Director of Army Signals, under instructions from the General Staff.

8. If required, telephones for internal communication at general and army headquarters will be provided by the air-line signal sections with those headquarters.

9. In the United Kingdom in war, the repair of permanent lines within the area of military operations is one of the functions of the air-line signal sections, assisted, when circumstances permit, by General Post Office civil construction parties.

12. EMPLOYMENT OF SIGNAL COMPANIES (LINES OF COMMUNICATION)

1. The signal companies (lines of communication) provide the signal communications within the limits of command of the Inspector-General of Communications. These communications include :—

- (a) Main lines of telegraph, consisting of one or more through lines between the base and general headquarters, and one or more local lines for communication between posts on the lines of communication, including the base, advanced base, regulating station and railheads.

(b) Such telephone communications as may be required for defence or administrative purposes at posts on the lines of communication. Trunk telephone lines between posts will be employed when available.

(c) Communication with supply columns when on the move within the sphere of command of the Inspector-General of Communications.

2. Telegraph and telephone communications for railway purposes are under the control of the Director of Railway Transport. (See Sections 5, 4; and 6, 2.)

These communications are not to be employed for other than railway purposes, except as may be ordered by the Inspector-General of Communications.

3. The signal companies, as far as possible make use of the permanent telegraph and telephone systems existing in the theatre of operations, supplementing them as may be necessary by field air-lines or semi-permanent lines.

4. In the United Kingdom the facilities provided by the General Post Office telegraph and telephone systems should render unnecessary the employment of any but small detachments of signal units on the lines of communication of forces in the field (*vide* Section 4, 2).

5. Where the telegraph and telephone systems are under the control of a friendly administration, arrangements for using them will be made by the Director of Army Signals, under the orders of the commander-in-chief. These will include "Handing-over offices" for transfer of messages between the two systems to be located at points of junction between the army signal system and that under the direct control of the friendly administration and selection of certain lines to be wholly taken over for army use.

6. In a hostile country, and in districts where martial law is in force, the Director of Army Signals employs the existing systems for army purposes as required, the technical personnel being drawn from military sources.

7. In addition to providing the signal system on the lines of communication, the signal companies, also provide the personnel required for such depôts of signal stores and repair shops as may be under the control of the Director of Army Signals and for the clearing house.

13. EMPLOYMENT OF REGIMENTAL INTERCOMMUNICATION PERSONNEL IN CONJUNCTION WITH THE ARMY SIGNAL SERVICE.

1. In addition to arranging for intercommunication within their own units, commanding officers will endeavour to open communication between themselves and their superior commanders, or neighbouring units, when this has not already been provided for by the Army Signal Service (Field Service Regulations, Part I, Section 8, paragraph 2 ; also Section 3, 1, above).

2. The employment of the intercommunication personnel of cavalry regiments, artillery brigades and infantry battalions is controlled by the signalling officer or adjutant of those units, under the orders of their commanding officers. These officers should, whenever possible, keep a reserve of signallers or despatch riders under their orders to meet any unexpected demand for intercommunication.

3. Artillery brigade signallers are trained to the same standard of efficiency as signallers of the signal service and form an integral part of the divisional artillery headquarters

and headquarters of artillery brigades. They are required to maintain communication between the divisional artillery commander and the artillery brigade headquarters ; between the artillery brigade headquarters and the headquarters of batteries and ammunition columns ; and to assist in the maintenance of communication between subordinate artillery commanders and the infantry.

The means of communication at the disposal of artillery brigade commanders are mounted orderlies, artillery brigade telephones and visual signalling. The telephone equipment with which each artillery brigade is provided is primarily intended to link up the brigade commander with his batteries but in favourable circumstances and subject to any assistance which it may be possible for the divisional signal service to render, it may also be used to maintain communication between the artillery brigade commander and the divisional artillery commander and between the commanders of the artillery and infantry carrying out an operation in combination. (See Section 10 (1).)

4. The bicycles provided for intercommunication are primarily intended for the use of the trained intercommunication personnel of a unit.

CHAPTER IV.—ORGANIZATION OF SIGNAL TRAFFIC.

14. METHODS OF TRANSMISSION OF CORRESPONDENCE IN THE FIELD.

1. The following means for transmission of correspondence are available in the field :—

- (a) Army Postal Service.
- (b) Army Signal Service and intercommunication personnel of units generally.
- (c) Special means, such as air-craft, staff and orderly officers.

Of these the first will be used for transmission of all correspondence not of an urgent character. Special means will be used only in exceptional cases.

2. The postal and signal services, though separately organized, must always act in close co-operation, rendering each other such mutual assistance as may be possible.

3. The Director of Army Signals or his representative at general or other headquarters is responsible for the expeditious despatch and delivery of all messages, &c., handed to the Army Signal Service for transmission.

15. ORGANIZATION OF SIGNAL OFFICES.

1. At general, army, divisional, and brigade headquarters several means of transmission are available—namely, telegraph or telephone lines, wireless or visual signalling stations, or despatch riders. If, therefore, messages are to be rapidly dealt with, and the several means of communication co-ordinated, the terminals of the message routes must be carefully organized under the direct control of the officer in charge of the signal service at the headquarters. For this purpose signal offices will be established at General and Army Headquarters to deal with all messages transmitted or received by the signal service.

At divisional and brigade headquarters the registers of messages kept by the staff will usually suffice for the needs of both the staff and the signal service, and the signal office may therefore be included in the staff office.

The personnel required at a headquarters signal office depends upon the size of the office. At general headquarters it will be necessary to have an officer constantly on duty at the office, with one or more registering clerks and their reliefs.

At army, divisional and brigade headquarters, a senior non-commissioned officer (with reliefs, if necessary) can perform the duties under the general supervision of the officer in charge of signal communications.

2. Messages for despatch by signal are sent to the signal office with a note as to the degree of urgency, and, if transmission is to be by more than one route, with the necessary number of copies. (Staff Manual Section 16.)

The officer in charge of signals, subject to the instructions of the General Staff, will decide the method of transmission.

3. The rapid despatch of urgent messages is provided for by the "priority" powers conferred on certain officers. A list of such officers will be prepared by the General Staff at general headquarters in consultation with the Adjutant-General's and Quartermaster-General's branches, and published in standing orders.

4. Priority messages received from different branches of the staff, or from offices of services or departments, will be despatched in the order in which they are received, but the Chief of the General Staff will, when he considers it necessary, order that an urgent operation order or message shall take priority of all others.

At times of heavy pressure, the most careful supervision is necessary in order to ensure that messages are sent in the order of their relative urgency, and this is a duty of the General Staff.

Should there be no General Staff officer present, the Director of Army Signals or his representative will assume responsibility in this matter.

5. Private messages should be sent only when the lines are clear of official messages. In consultation with the General Staff, the Director of Army Signals is responsible for the issue of instructions regarding the sending of private messages through the signal service. These instructions will be submitted to the Chief of the General Staff for the approval of the Commander-in-Chief.

6. Outgoing messages are recorded at a headquarters signal office in a register which should contain only such information as is necessary to trace the disposal of a message.

Incoming messages will not be registered, but will be delivered from the signal office to the addressees.

Messages received at general and army headquarters will be delivered by the Signal Service to the staff in triplicate. This does not apply to messages received by despatch rider.

7. At general headquarters messages addressed to the Commander-in-Chief, to General Headquarters, or to the General Staff, will be delivered by the Signal Service to the Central Office of the General Staff.

Messages addressed to the Adjutant-General's and Quarter-master-General's branches will be delivered to the Central offices of those branches. The procedure will be similar at army and other headquarters.

8. Special care is to be observed in safeguarding the signal service copies of messages.

9. Each of the terminals of signal routes controlled by a signal office is in the charge of the senior non-commissioned officer or operator at the terminal, who is responsible—

- (i) For the despatch, in their proper order, of messages handed over to the terminal for transmission.
- (ii) For sending to the headquarters signal office all messages received at his terminal for delivery.
- (iii) For reporting to the officer or non-commissioned officer in charge of the headquarters signal office any breakdown in communication, or block in signal traffic, due to pressure of work, or other cause.

Telegraph, telephone and wireless terminals should, as far as possible, be grouped to work under a N.C.O. as superintendent. When circumstances admit, the terminals should be incorporated with the signal office; close proximity greatly facilitates supervision and rapidity of despatch.

Despatch riders will usually work directly under the instructions of the officer or non-commissioned officer in charge of the signal office.

10. The work of passing messages between the signal office and the terminals controlled by it, as well as the delivery of messages to the addressees, is undertaken by the personnel of the signal service in so far as may be consistent with their other duties; but an operator at a signal office or station will not, unless in exceptional circumstances, leave it to deliver a message. If assistance is required in the work of delivery, the officer in charge of signals should

apply to the General Staff or brigade-major as the case may be.

11. The headquarters signal office, which should be situated where it can be readily found by despatch riders and others having messages to deliver, will alone fly the "Flag, distinguishing, field telegraph" (when this flag is used), and messages should, as a rule, be handed in only at this office. When, however, time will be saved by so doing, messages may be accepted at any terminal.

16. INSTRUCTIONS IN REGARD TO SIGNAL TRAFFIC.

1. Every officer or non-commissioned officer in charge of a signal office or station is responsible for reporting to the commander (or his representative) of the formation to which the signal office or station is attached, any breakdown in the communications and any serious delay in the despatch of messages due to blocks in signal traffic, or other causes.

2. The officer in charge of signal communications at a headquarters will keep a diagram showing the routes available for intercommunication at the headquarters, keeping the responsible staff officer informed as to the working of the signal service, and reporting when new routes are opened.

He will also keep the signal officers at other headquarters supplied with such information in regard to arrangements for intercommunication as may be necessary for the disposal of signal traffic.

The conventional signs to be employed in drawing out circuit diagrams for the Army Signal Service are given in Appendix A.

3. Every signal office or station should be provided with a list of officers entitled to send "priority" messages.

Officers in charge of signal communications should bring to the notice of the General Staff any abuse of the authority tending to cause congestion in signal traffic.

4. A signal office is not required to report the delivery of messages. Where such information is required, the sender should ask the addressee to acknowledge receipt of the message. When, however, a signal office or station has been unable to deliver a message to an addressee, it sends a "S.G." message to the office of origin, reporting non-delivery. The latter office will then at once inform the sender.

In order to avoid congestion of signal traffic the sender of a message should only ask for an acknowledgment in the case of important messages, and when it is necessary to know quickly that a message has been received.

5. All signal messages are strictly confidential and messages or their meanings are not to be disclosed without authority.

It is the duty of all ranks of the Army Signal Service to prevent unauthorized persons loitering within sight or hearing of a signal office or station.

6. The responsibility for deciding whether a message for despatch shall be in cipher or in clear rests with the officer who drafts it and not with the Signal Service.

7. All message forms and papers on which any work of deciphering has been done will be burnt immediately the work is finished.

CHAPTER V.—MAINTENANCE OF SIGNAL UNITS IN THE FIELD.*

17. SUPPLIES.

1. The commanders of all detachments from signal units will arrange for supplies for their detachments to be included in the supply sections of the trains of the units to which they may be temporarily attached, whenever difficulty is likely to be experienced in delivering supplies from the train allotted to their signal units.

2. A signal troop with a cavalry brigade is attached to the brigade headquarters for supply purposes.

Similarly, Nos. 2, 3 or 4 sections of a divisional signal company will obtain their supplies through the brigade headquarters to which they are attached.

3. The wagons of army troops trains carrying the supplies of army troops signal units will be distributed to the best advantage for the supply of the detachments of those units allotted to general and army headquarters respectively, the officers in charge of signals at the headquarters notifying the supply officers concerned as to any changes in the allotment.

4. Supplies of petrol for wireless signal stations and motor cycles, and oil and wick for signal lamps carried in 1st-line transport, are replenished as required through the supply service. Commanders of units and detachments will inform the supply officer concerned, in advance as to their probable requirements.

18. PERSONNEL.

1. When the distribution of reinforcements for signal units is in question, the Anjustant-General's office at the

* See Field Service Regulations, Part II.

base will consult the Deputy Director of Army Signals as to the units to which the men should be sent, having regard to their technical qualifications.

2. Casualties in signal units, or (if not in touch with the headquarters of their unit) detachments, are replaced in accordance with the procedure laid down in Field Service Regulations, Part II, Section 29.

19. EQUIPMENT, TRANSPORT AND REMOUNTS.

1. The normal routine for replacement of casualties and deficiencies of all kinds will be as laid down in Field Service Regulations, Part II.

2. For special requirements of signal units, such as—

- (i) Erection of lines of greater length than their normal equipment permits ;
- (ii) Replacement of the equipment in lines laid down by them which have had to be left down for use by other units ;
- (iii) Repair at existing permanent lines to an extent beyond the capability of their normal equipment ;

the Deputy Director of Army Signals, under instructions from the Inspector-General of Communications, will organize at convenient points expense depôts of such technical equipment and stores as are likely to be required, as well as repair shops for the overhaul of line stores, and for the repair and testing of instruments recovered from lines no longer required.

Demands to meet normal routine requirements in equipment and stores of field signal units will be made upon the ordnance depôts through the usual channels, and will only in exceptional circumstances be supplied from the expense depôts of the Deputy Director of Army Signals.

**CHAPTER VI.—INSTRUCTIONS FOR FOREIGN
TELEGRAMS.**

(Will be issued later.)

CHAPTER VII.—THE CLEARING HOUSE AND FINANCIAL INSTRUCTIONS.

20.—ORGANIZATION OF CLEARING HOUSE.

1. The objects for which the clearing house is established are :—

- (i) To control the financial working of the signal service.
- (ii) To collect, check, and guard office copies of messages for reference and for statistics.

2. The officer in charge of the clearing house is termed the superintendent. He is appointed by, and is directly responsible to the Director of Army Signals. The clearing house is located at the administrative headquarters of the signal service. An assistant superintendent, who should be a warrant officer, or N.C.O. not below the rank of serjeant, and three or more clerks are required. These N.C.Os. and men should be telegraph operators.

3. A suitable building is required, provided with a safe and presses, with space for several large tables. The presses and the rooms should be under lock and key.

4. To the superintendent, clearing house, are sent daily, weekly, or monthly, as ordered, all office copies of messages, and signal masters' cash accounts. It is the duty of the superintendent to compile from these a consolidated account of signal services.

21.—PRINCIPLES OF CLEARING TELEGRAPH WORK.

1. The general principles of "clearing" telegraph message work are as follows :—

Although any one telegraph administration may have a special tariff for its internal traffic, yet the tariffs for telegrams passing between any two contiguous administrations, or from any one administration to any other external administration, are governed by International Convention.

2. These tariffs are of two kinds.

(a) Rates charged by the original and final administrations, termed *Terminal* rates.

(b) Rates charged by intermediate administrations, termed *Transit* rates.

These rates are fixed per word pure and simple. The franc is the monetary unit employed in the preparation of international accounts.

3. If a telegram originating in one administration is passed to another, the former retains its own terminal rate, and credits the whole remaining tariff to the other. If a message is received by one administration from another, the former debits the latter with the former's terminal (or transit) rate. Certain cases when messages are "charged forward" are exceptions.

4. The exchange of accounts between contiguous administrations takes place monthly, and within the 3 months subsequent to the month to which the accounts relate. Revision of such accounts is only admissible within 6 months from date of rendering. Errors not exceeding 1 per cent. are not questioned.

5. The information required for the preparation of these accounts can mostly be ascertained from the forwarded forms; under certain conditions, however, the received and transmitted forms must also be referred to.

6. Message forms are received from signal masters,

docketed and made up into daily packets. On arrival they should be checked against the dockets to see that none is missing. The messages will be abstracted at the clearing house, except in the case of particular offices that may be ordered by the Director of Army Signals to render abstracts.

The tariffs due on the messages must also be checked against the signal masters' cash accounts.

The total number of messages and of words should be carried to a summarizing sheet, with a view to obtaining statistics of the amount of traffic dealt with.

7. It is generally quite impossible to assemble all the copies of a message; it will be sufficient therefore to sort out the transmitted and received copies into bundles according to their offices of origin, eventually attaching these bundles to the bundles of forwarded messages for that office. A certain number of offices, however, should have their messages assembled and checked as a precaution against the fraudulent suppression of the forwarded forms. When an office takes over messages from a contiguous administration on "transmitted" forms, these forms must be treated as "forwarded" forms, as described in para. 8 below.

8. The forwarded forms from each office for monthly periods should be sorted into classes as follows:—

- (1) Private and press messages, paid.*
- (2) Private and press messages, supported by warrants on London banks.
- (3) Private and press messages, supported by warrants on local banks.

* Sometimes in semi-civil portions of the administration the use of stamps may become necessary. This, however, may be regarded as a special case, and special local regulations will be required to meet it.

- (4) Franked messages on account of the army.
- (4A) Franked messages on account of the government of the country.
- (4B) Franked messages on account of any other government.
- (5) Service messages ("D.S." and "S.G.").

Other classes may be required (such as messages at special rates, "indulgence" telegrams).

9. The forwarded messages of each office are then abstracted under each of the above-mentioned classes. A.F.B. 118 is suitable for this purpose, unless there is more than one other administration contiguous to the army signal administration, in which case forms must be specially obtained with a larger number of money columns. The columns on A.F.B. 118 are labelled "Army Signals," "P.O.," and "Total." In the first column will be entered the proportion of the charge due to the army signal administration; the whole of the remainder of the charge, including any charges collected for a paid reply, will be entered in the column marked "P.O." If there is more than one contiguous administration this "remaining charge" must be entered in the column of the special form which is set apart for the administration to which the message will be handed over.

10. Received forms on which charges for portorage or redirection fees have been collected should be specially entered on the forwarded abstract sheet of the appropriate class, a note being made against the number of the message in the received abstract, or a slip placed in the bundle if a received abstract is not rendered.

11. If the conditions are fairly simple it will often be possible to arrange for this abstracting into classes to be

done by the signal masters, in which case the abstract sheets will only require checking at the clearing house.

12. Incoming transmitted forms at offices taken over from contiguous administrations must also be abstracted in a similar way. We shall then have further classes :—

(6) Messages handed over from Administration X.

(6A) Messages handed over from Administration Y, etc.

13. When all the abstract sheets of all the offices have been checked for a monthly period, the totals from all the offices are collected into a general abstract sheet for each class. These are again collected into two summaries :—

(1) Messages originating in the army signal administration.

(2) Messages taken over from other administrations.

14. From these will be ascertained :—

(a) Cash due to the public.

(b) Credits recoverable from other administrations.

(c) Debits due to other administrations.

The superintendent, clearing house, will prepare vouchers as necessary to enable the paymaster to bring to account the sums received by signal masters and to effect recovery of amounts due from outside administrations or other sources.

15. Certain complications arise, such as reply paid charges on incoming messages from other administrations, which may or may not be claimed by them eventually, and errors and refunds of various sorts. It will therefore generally be convenient to keep records of liabilities and payments for each administration.

16. Payment of claims from other administrations will be made by the Paymaster i/c Command Services, on certificate from the Director of Army Signals or his representative as to their correctness.

17. The signal account will be examined monthly by the Paymaster i/c Command Services. Signal masters' cash accounts, with the supporting vouchers, will be forwarded, as soon as the superintendent, clearing house, has done with them, to the Paymaster i/c Pay Office Clearing House, who will secure that credits have been duly brought to account by imprest holders.

22.—ACCOUNTING FOR CASH.

1. Cash may be received by the signal service in the following ways :—

- (1) Cash paid to signal masters for charges on telegrams handed in at their offices.
- (2) Cash paid to Director of Army Signals or his representative for hire of telephone circuits, or other similar service.
- (3) Cash issued by paymaster on imprest.

2. Signal masters will keep cash accounts (or stamp accounts) in which will be recorded all money received for the despatch of messages, &c., and the manner of its disposal (*see* para. 4 below).

3. Imprest accounts will be opened by the superintendent, clearing house, and such officers of the signal service as may be necessary for the payment of troops, &c. They will be forwarded monthly to the Adjutant-General's office at the base for transmission to the paymaster.

4. Money received by signal masters will be handed over to

an officer of the Army Signal Service, who is an imprest holder, or to a field paymaster; or, if neither course is practicable, to any officer who is an imprest holder. The receipt of the recipient will be a sufficient voucher for the signal master's account.

5. Money handed over by signal masters to officers may be utilised by them in the same way as sums received on imprest. Any cash surplus to requirements, or in the form of cheques, orders, &c., should be handed over to field paymasters as convenient.

6. Pay of soldiers may be issued by any officer who is an imprest holder. All payments will be entered and attested in the man's pay book (A.B. 64), and his receipt obtained on an acquittance roll (A.F. N. 1513). The acquittance roll should be forwarded on the day of payment to the Adjutant-General at the base, a carbon copy (with a reproduction of the man's receipt) being retained for reference.

7. Wages of civilians, &c., will, as a rule, be paid by field paymasters or imprest holders only on the authority of the Paymaster i/c Command Services. In special circumstances, however, they may be issued by imprest holders on the authority of an officer of the signal service.

23.—FINANCIAL STATEMENT.

1. A financial statement will be prepared by the Director of Army Signals at the close of the campaign, which will vary with circumstances, but may contain :—

- (a) Cash statement.**
- (b) Financial statement.**

2. The cash statement should show clearly that all cash received has been properly accounted for.

It may contain on the one side :—

- (a) Cash receipts on account of telegraphs and telephones.

And on the other :—

- (d) Vouchers for cash handed over to pay department.
- (e) Vouchers for cash paid on account of pay of soldiers.
- (f) Vouchers for cash paid on account of civilians, purchase of stores, etc., through the imprest.

3. The financial statement may contain on the one side :—

- (a) Cash taken.
- (b) Payments from other administrations.
- (c) Value of unpaid work for other governments, at rates agreed upon.
- (d) Value of stores surplus to equipment.

And on the other :—

- (e) Payments to other administrations.
- (f) Pay of officers and soldiers.
- (g) Payments for civilians, and stores (imprest).
- (h) Cost of railway carriage.
- (i) Value of ordnance stores expended.

The paymaster's accounts may be of assistance in compiling this statement.

24.—MISCELLANEOUS DUTIES.

1. All messages, diaries, and accounts will be guarded at the clearing house until the close of the campaign, as they may be required for reference, or for historical purposes.

2. Statistics will be prepared as regards lines and offices working, and the amount of work done by each. Diagrams

of communications will also be made at various times as a record.

3. As far as possible a check will be kept on the distribution of individuals of the personnel, to facilitate the preparation of medal rolls if required.

4. It will be the duty of the superintendent, clearing house, to make the necessary distribution by means of Director of Army Signals' circulars of information required by the signal service, such as :—

- (a) Tariffs and routes.
- (b) Officers entitled to frank " Priority " messages.
- (c) Persons other than officers entitled to frank " free " messages, and the service to which they are to be charged.
- (d) Censoring regulations.
- (e) Abbreviated addresses, and other similar regulations.

If the campaign is of long duration it will be advisable to issue at intervals printed copies of previous circulars.

5. The superintendent, clearing house, will be responsible for notifying to other administrations the names of the more important telegraph offices opened and closed.

Signs used for showing Types of Instruments, Lines of Signal Communication, &c.

INSTRUMENTS.

Wheatstone.	
Quadruplex.	
Duplex.	
Simplex.	
Vibrator.	
Telephone.	
Wireless wagon station (large).	
Wireless pack station (small).	
Wireless station erected and working.	
Visual signalling station.	

LINE OF SIGNAL COMMUNICATION.

Permanent line.	
Air-line.	
Cable (D.5.).	
Cable (D.1. or D.3.).	
Wireless.	
Visual.	
Despatch Rider.	

A cable office when working is underlined, thus :—PSJ

A lineman is shown by his number and his detachment, thus :—SJ/8.

The number of miles of cable available with a detachment is shown in a circle, thus :—

As an example:

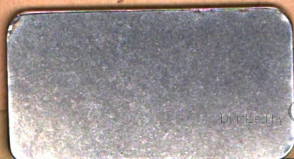
would show that of SJ detachment (see Instruction in Army Telegraphy and Telephony, Vol. II, Chap. I, para. 17A.), all three offices were present, the wagon office was working, and 8 miles of cable were available; also No. 8 of the detachment was the lineman in charge.

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